

Notice of Allowability

Application No.

09/628,828

Examiner

Qi Han

Applicant(s)

RIGAZIO ET AL.

Art Unit

2654

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 08/30/2005.
2. ☒ The allowed claim(s) is/are 1-4,6-19 and 21-24.
3. ☒ The drawings filed on 08/30/2005 and 12/06/ 2005 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892).
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

Response to Amendment

1. This communication is responsive to the applicant's amendment dated 08/30/2005 and the RCE filed 10/07/2005. Applicant amended claims 1 and 10, specification and drawings (include recently submitted Figs 1,3 5 and 6, filed on 12/06/2005), and cancelled claim 20 (see examiner's amendment below).

Examiner's Amendment

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this Examiner's Amendment was proved by applicant representative, Gregory A. Stobbs, through a telephone interview on 12/22/2005. The Examiner's Amendment is as following:

In the Claim (refer to the amendment dated 08/30/2005):

Claim 1, on page 2:

line 1 of the claim, after "improvement in a dynamic program system",
insert --for speech recognition--;

line 3 of the claim, replace "a tree data structure" with --a lexical tree data
structure--;

line 4 of the claim, replace "said tree data structure" with --said lexical tree data structure--;

line 7, before "a traversal algorithm implemented", insert --a means for processing--.

line 15 of the claim, replace "said tree data structure" with --said lexical tree data structure--;

Claim 10, on page 5:

line 1 of the claim, after "improvement in a dynamic program system", insert --for speech recognition--;

line 3 of the claim, replace "a tree data structure" with --a lexical tree data structure--;

line 4 of the claim, replace "a tree data structure" with --a lexical tree data structure--;

line 12, before "a traversal algorithm implemented", insert --a means for processing--.

line 19 of the claim, replace "the tree data structure" with --the lexical tree data structure--;

Claim 20, on page 5: cancel this claim.

-----end of Examiner's Amendment-----

Allowable Subject Matter

3. Claims 1-4, 6-19 and 21-24 are allowed.

The following is an examiner's statement of reasons for allowance:

Regarding independent **claims 1 and 10**, the instant application is directed to an improvement in a dynamic programming (DP) system for speech recognition. Each independent claim, combining some well-known features of the DP system, identifies the uniquely distinct features of using a lexical tree data structure; designating active nodes; processing a traversal algorithm traversing an active nodes envelope made up of a subset of the nodes based on a set of traversal rules, whereby nodes of a given generation of said active nodes envelope are processed before any parent nodes of given generation are processed, a deepest child generation of said active nodes envelope is processed first, and traversal among nodes of each generation of said active nodes envelope proceeds in the same topological direction, wherein the traversal algorithm include a dynamic programming process that assigns probability scores to nodes based on knowledge of their respective child nodes in order to propagate the active nodes envelope in said lexical tree data structure (for claim 1);

or using a lexical tree data structure; designating active nodes; processing a traversal algorithm traversing the nodes based on a set of traversal rules whereby only said active nodes that are determined as having a probability score above the pre-determined search threshold are traversed, wherein said traversal algorithm includes a dynamic programming process that traverses said active nodes envelope in a backwards direction, from the deepest child generation

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of said active nodes envelope toward the root of said active nodes envelope, and assigns probability scores to nodes in order to in order to propagate the active nodes envelope in the lexical tree data structure (for claim 10).

4. The prior art of record, Kao (US 6,374,222 B1) and Mitchell et al. (US 6,574,595) 4,972,484), provided numerous teachings and approaches for speech recognition, including building a dynamically changing search tree (lexical tree), dynamic programming with Viterbi algorithm and beam search algorithm using backward trace, active states, and accumulated acoustic score and lexicon HMM. However, the combined features stated above, are not anticipated by, nor made obvious over the prior art of the record.

5. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

6. Please address mail to be delivered by the United States Postal Service (USPS) as follows:

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Effective January 14, 2005, except correspondence for Maintenance Fee payments, Deposit Account Replenishments (see 1.25(c)(4)), and Licensing and Review (see 37 CFR 5.1(c) and 5.2(c)), please address correspondence to be delivered by other delivery services (Federal Express (Fed Ex), UPS, DHL, Laser, Action, Purolater, etc.) as follows:

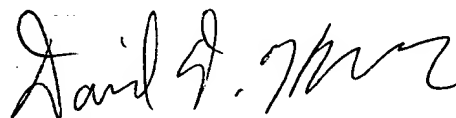
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Qi Han whose telephone numbers is (571) 272-7604. The examiner can normally be reached on Monday through Thursday from 9:00 a.m. to 7:00 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil, can be reached on (571) 272-7602.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Inquiries regarding the status of submissions relating to an application or questions on the Private PAIR system should be directed to the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 703-305-3028 between the hours of 6 a.m. and midnight Monday through Friday EST, or by e-mail at: ebc@uspto.gov. For general information about the PAIR system, see <http://pair-direct.uspto.gov>.

QH/qh

December 22, 2005



DAVID D. KNEPPER
PRIMARY EXAMINER